

# Claims

[c1] WHAT IS CLAIMED IS:

1. A method for continuously controlling the heating of heating elements, particularly heating elements in an automotive vehicle seat comprising: providing a control circuit for providing an electrical current to at least one heating element using Pulse Width Modulation (PWM) adapted to receive signals from at least one temperature sensor, each of at least one temperature sensor substantially constantly monitoring at least one heating element temperature; providing a heating current to each of said at least one heating element, the heating current voltage being controlled by Pulse Width Modulation (PWM) by said control circuit; substantially constantly adapting a voltage signal applied to each of said at least one heating elements in an initial transient state during which a maximum voltage is applied to each of said at least one heating elements until said at least one heating elements have reached a desired percentage of a desired temperature, and then in a permanent state during which said voltage signal is applied in the form of a fixed frequency pulse train and variable working cycle characterized in that said voltage applied to said at least one heating ele-

ment is modified by the physical features of each of said at least one heating elements and the surrounding environment of said at least one heating elements substantially constantly throughout the life of said at least one heating element.

[c2] 2. A method according to Claim 1 wherein, the said constantly adapting of said voltage signal applied during said permanent state is achieved using in-line monitoring of the temperature of each of said at least one heating element through said at least one temperature sensor.

[c3] 3. A method according to Claim 2, wherein a plurality of temperature values obtained from said in-line monitoring are utilized to determine a voltage signal working cycle parameter  $\tau$  using the equation: (Equation A here) wherein:  $T$  is the monitored temperature, and  $T_f$  is the desired temperature selectable from among at least two preset values.

[c4] 4. A method according to Claim 3, wherein each set of values of, temperature  $T$ , assigned temperature  $T_f$ , and said voltage signal working cycle parameter  $\tau$ , is stored by said control circuit and provides a dynamic table to provide a continually updated working cycle for said fixed frequency pulse train voltage signal.

- [c5] 5. A method according to Claim 1, wherein said desired percentage of said desired temperature  $T_f$  is approximately about 90%.
- [c6] 6. A method according to Claim 1, wherein at least one heating element comprises at least one heating element located in a backrest of an automotive vehicle, and at least one heating element located in a corresponding seat of said automotive vehicle.
- [c7] 7. A method according to Claim 6, wherein said heating elements each comprise a mesh heating elements (MAT).
- [c8] 8. A method according to Claim 6, wherein said heating elements are connected in series.
- [c9] 9. A method according to Claim 8, wherein the free contact of the heating element located in said backrest is connected to a normally open contact of a Solid State Relay forming part of said control circuit, and the free contact of the heating element located in said seat is connected to ground.
- [c10] 10. A method according to Claim 9, wherein said Solid State Relay comprises a power transistor and said normally open contact is the source of said transistor.
- [c11] 11. A method according to Claim 1, wherein said at least

one temperature sensor comprises at least one NTC resistance.

- [c12] 12. A method according to Claim 1, wherein said at least one heating element is positioned in a automotive vehicle interior component, such as for example, a panel, dashboard and an armrest.
- [c13] 13. A method according to Claim 1, wherein said at least one heating element is positioned in an interior of a building.
- [c14] 14. A method according to Claim 1, wherein said at least one heating element is positioned in a piece of furniture.
- [c15] 15. A method according to Claim 1, wherein said at least one heating element is positioned in an electric blanket.
- [c16] 16. A method according to Claim 1, wherein said at least one heating element is positioned in a cushion.
- [c17] 17. A method according to Claim 1, wherein said at least one heating element is positioned in an outerwear garment.